

MESOAMERICAN *SISYRINCHIUM* (IRIDACEAE):
NEW SPECIES AND RECORDS, AND
NOTES ON TYPIFICATION¹

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ABSTRACT

This paper supplements our treatment of *Sisyrinchium* for *Flora Mesoamericana* in which 13 species are recognized. One new species is described, *S. subalpinum*, from Mexico (only Chiapas), Guatemala, and Costa Rica. *Sisyrinchium trinerve*, previously known from Andean South America, *S. dimorphum* from Texas and northern Mexico, *S. longispathum* from Oaxaca, Mexico, and *S. subcernuum* from northern Mexico are reported in Mesoamerica for the first time. The type material for *S. convolutum*, *S. tenuifolium*, *S. mandonii*, *S. tinctorium*, and *S. bogotense* has been examined and a lectotype designated for each species.

In preparation for a treatment of Iridaceae for *Flora Mesoamericana* (Henrich & Goldblatt, in press), it has become clear that previous regional treatments of *Sisyrinchium* are to varying degrees inadequate or erroneous. The same species are treated under different names in some floras and few of the species have been matched with their types. Notes are thus presented here on the typification of several widely recognized species to supplement the formal treatment. There is also apparently one new species in Mesoamerica, *S. subalpinum*, a yellow-flowered species of section *Echthronema* Benth. This is a dwarf, high-altitude relative of the common *S. tinctorium*. We also report for the first time the oc-

currence in Mesoamerica of the Andean *S. trinerve*, the northern Mexican *S. subcernuum*, the southern Mexican *S. longispathum*, and the predominantly Texan *S. dimorphum*. Finally, the species previously identified as *S. iridifolium* Kunth in Guatemala and Honduras corresponds closely to the Oaxacan *S. exalatum*, a tall, branched species with narrow leaves and thickened roots sometimes swollen terminally.

We recognize 13 species (Table 1) of *Sisyrinchium* in Mesoamerica, which is regarded for the *Flora* as including all the territory from the southern Mexican states of Yucatán, Campeche, Tabasco, Quintana Roo, and Chiapas southward to Panama. The species are numbered as they

TABLE 1. The species of *Sisyrinchium* recorded from Mesoamerica with their general distributions.

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| <i>S. chiricanum</i> Woodson | Mexico (Chiapas), Guatemala, El Salvador, Costa Rica, Panama |
| <i>S. convolutum</i> Nocca | Chiapas, Mexico to Panama, possibly the north coast of South America |
| <i>S. dimorphum</i> R. Oliver | U.S.A. (Texas), Mexico, Guatemala |
| <i>S. exalatum</i> Robinson & Greenman | southern Mexico (Oaxaca, Chiapas), Guatemala, Honduras |
| <i>S. johnstonii</i> Standley | Mexico (Chiapas), Guatemala, Costa Rica |
| <i>S. longispathum</i> Conzatti | Mexico (Oaxaca, Chiapas) |
| <i>S. mandonii</i> Baker | Guatemala, Costa Rica, Panama, Peru, Bolivia |
| <i>S. micranthum</i> Cav. | Mexico to South America, West Indies |
| <i>S. subalpinum</i> Henrich & Goldbl. | Mexico (Chiapas), Guatemala, Costa Rica |
| <i>S. subcernuum</i> (Bicknell) Henrich & Goldbl. | Mexico, Belize |
| <i>S. tenuifolium</i> Humb. & Bonpl. ex Willd. | Mexico, Guatemala, Panama |
| <i>S. tinctorium</i> Kunth | southern Mexico to Colombia and Venezuela |
| <i>S. trinerve</i> Baker | Costa Rica, Colombia, Venezuela, Ecuador to Bolivia |

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appear in the *Flora* treatment. Species 1–3 belong Bentham) and 4–12 to section *Echthronema* to section *Sisyrinchium* (= section *Bermudiana* (Bentham, 1883).

KEY TO *SISYRINCHIUM* IN MESOAMERICA

- 1a. Flowering stems unbranched, consisting of 1 long internode without cauline leaves, but sometimes with a terminal bract subtending the opposed spathes of the 1–3 apical inflorescence units (rhipidia) (occasionally rhipidia with a short stalk, more often sessile).
 - 2a. Leaves filiform, to 1 mm wide; inflorescence units 1–3 8. *S. longispathum*
 - 2b. Leaves linear to lanceolate, at least 1.5 mm wide; inflorescence units 1 or 2.
 - 3a. Roots tuberous, fleshy (Fig. 1A); flowers blue to white 3. *S. johnstonii*
 - 3b. Roots fibrous or thickened but not tuberous (Fig. 2B, D); flowers yellow.
 - 4a. Flowering stems subterete and not winged; ovary included in the upper part of the spathes 7. *S. trinerve*
 - 4b. Flowering stems flattened and winged; ovary exserted.
 - 5a. Spathes (20–)25–50 mm long, the outer longer (sometimes twice) than the inner 11. *S. tinctorium*
 - 5b. Spathes 11–16 mm long, usually subequal.
 - 6a. Plants 5–12 cm tall; roots slender but somewhat thickened (Fig. 3) 12. *S. subalpinum*
 - 6b. Plants 15–25 cm tall; roots fibrous (Fig. 2D) 13. *S. subcernuum*
 - 1b. Flowering stems consisting of more than 1 internode, branched or at least with 1 or more cauline leaves.
 - 7a. Roots fibrous or thickened and cylindric, sometimes with persistent hairs (Fig. 1B, C).
 - 8a. Annuals 5–15(–25) cm tall; capsules 3 mm long, globose 2. *S. micranthum*
 - 8b. Perennials (15–)20–60 cm tall; capsules 4–5 mm long and globose, or 8–11 mm long and obovoid.
 - 9a. Flowers blue; spathes 14–18 mm long 1. *S. dimorphum*
 - 9b. Flowers yellow, spathes 26–32 mm long.
 - 10a. Roots with persistent hairs throughout or at least near the base (Fig. 1B) 5. *S. chiricanum*
 - 10b. Roots smooth, not bearing persistent hairs (Fig. 1C) 4. *S. exalatum*
 - 7b. Some roots tuberous and fleshy, either close to or remote from the stem base (Fig. 2A, C).
 - 11a. Basal leaves 3–8 mm wide, narrowly to broadly lanceolate to falcate.
 - 12a. Plants usually less than 30 cm high and with falcate leaves; capsules strongly 3-lobed; usually with swollen fusiform roots thickened from the base (Fig. 2A) 6. *S. convolutum*
 - 12b. Plants usually more than 30 cm high and with lanceolate leaves; capsules obscurely 3-lobed; roots thickened, if at all, distant from the base (Fig. 1C) 4. *S. exalatum*
 - 11b. Basal leaves 0.5–2 mm wide, linear; capsules not strongly 3-lobed.
 - 13a. Capsules globose, 5–7 mm long 9. *S. tenuifolium*
 - 13b. Capsules oblong, 12–16 mm long 10. *S. mandonii*

NOTES ON SELECTED SPECIES

1. ***Sisyrinchium dimorphum*** R. Oliver, Ann. Missouri Bot. Gard. 55: 397. 1969. TYPE: United States. Texas: Val Verde Co., San Felipe Springs, Del Rio, Warnock & Cameron 9894 (holotype, SMU).

A species of *Sisyrinchium* from Chiapas and Guatemala sometimes identified as *S. scabrum* in herbaria appears to match *S. dimorphum*, which is recorded from Texas and Tamaulipas, Mexico. *Sisyrinchium dimorphum* is of moderate size with relatively short leaves 1–2 mm wide, a branched stem, and persistent fibrous leaf bases, distinctive in *Sisyrinchium*. It clearly belongs in section *Sisyrinchium* and has the blue (to white) campanulate perianth and connate (or nearly connate) filaments that characterize the group. The Mexican *S. scabrum*, typified by Schiede

1020 (HAL), is similar in general morphology yet it is smaller in stature, has a smaller flower with an unusually small, sparsely pubescent ovary less than 1 mm long, and globose capsules ca. 2 mm in diameter, whereas *S. dimorphum* has a glabrous ovary ca. 2 mm long and larger, somewhat obovoid capsules 4–7 mm long.

4. ***Sisyrinchium exalatum*** Robinson & Greenman, Amer. J. Sci. 50: 166. 1895. TYPE: Mexico. Oaxaca: Cuilapan Mountains, 7,000 ft., Smith 52 (not seen). Figure 1C.

When reported from Guatemala and Honduras (Standley & Steyermark, 1952; Molina, 1975), *Sisyrinchium exalatum* was treated as *S. iridifolium* Kunth. We concur in regarding it as different from all other Mesoamerican species but it does not correspond with *S. iridifolium*. This

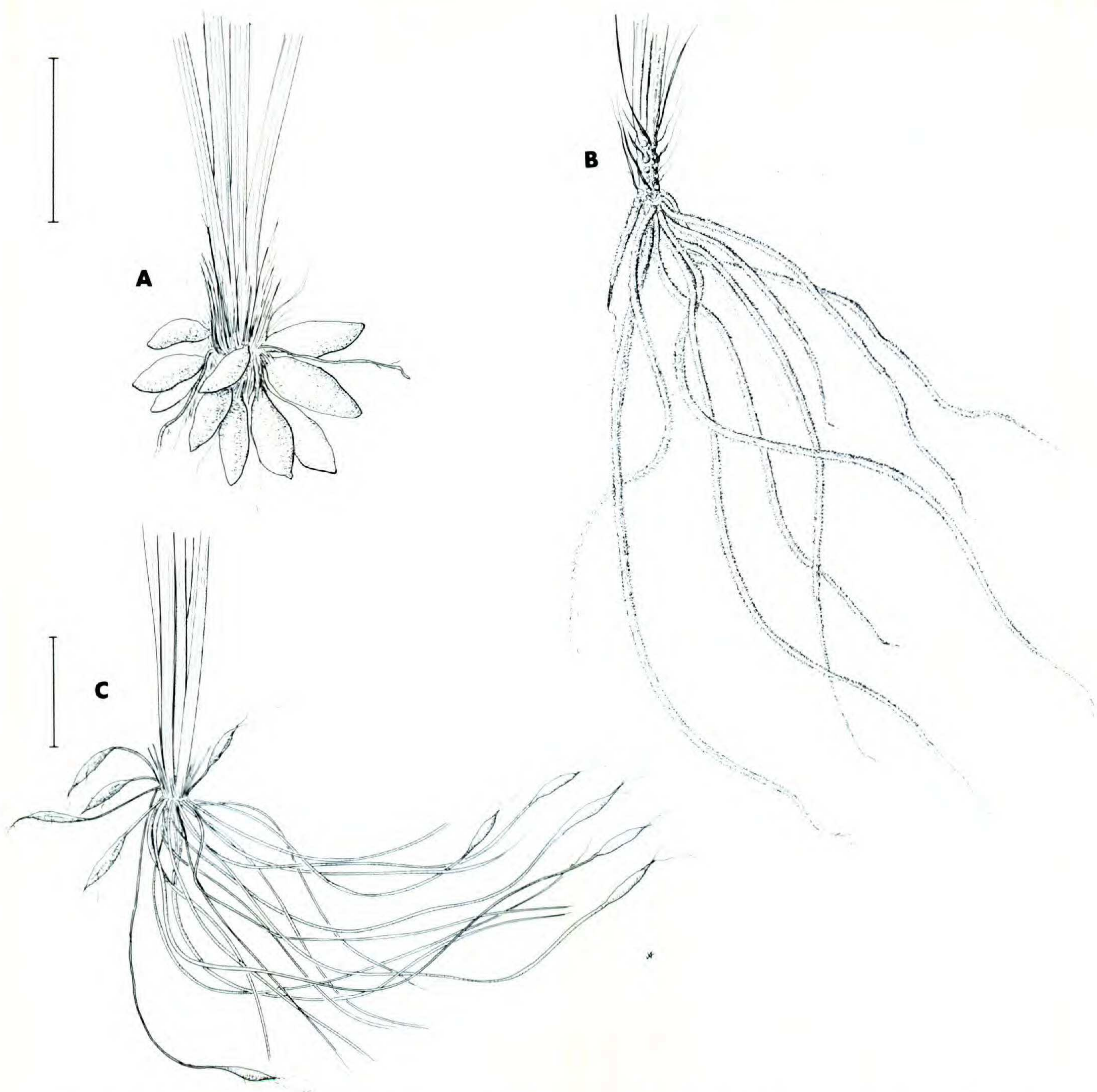


FIGURE 1. Root systems and stem bases.—A. *Sisyrrinchium johnstonii*.—B. *S. chiricanum*.—C. *S. exalatum*. Scale bars = 2 cm; top bar for A, B.

is a South American species, the type from Caracas, Venezuela, which is similar to *S. exalatum* in leaf and stem morphology, but the roots are fibrous and not thickened as in the latter and the capsules are relatively small and nearly globose, rather than obovoid-ellipsoid and somewhat trigonous.

In Mesoamerica *Sisyrrinchium exalatum* occurs in Mexico (Chiapas), Guatemala, El Salvador, and Honduras. It grows on grassy to lightly wooded slopes at elevations of 1,700–3,700 m.

Additional specimens examined. MEXICO. CHIAPAS: north end of San Cristóbal Las Casas, *Breedlove* 6045 (F). EL SALVADOR. MORAZAN: slopes of La Montañita,

1,700 m, *Williams & Molina R.* 10429 (F, MEXU, MICH, MO). GUATEMALA. HUEHUETENANGO: between Tojquiá and Caxín bluff, *Steyermark* 50141 (F); Sierra Cuchumatanes, *Skutch* 1243 (F). QUEZALTENANGO: Santo Tomás, *Steyermark* 34825 (F). HONDURAS. COMAYAGUA: abierto de La Piramide, *Molina R.* 14357 (F).

6. *Sisyrrinchium convolutum* Nocca, Ticin, Hort. Pl. pl. 1. 1800. TYPE: Guiana “Cap. B. Spei,” cultivated in “Hort. Parolin,” collector unknown (lectotype, BASSA, here designated). Figure 2A.

Sisyrrinchium guatemalense (Baker) Standley & Steyer., Publ. Field Mus. Nat. Hist., Bot. Ser. 23: 39. 1944; Flora of Guatemala, Fieldiana, Bot. 24:

173. 1952. *S. alatum* var. *guatemalense* Baker, Handbk. Irideae 180. 1892. TYPE: none cited nor located but authentic material at K, annotated by Baker.

Sisyrinchium convolutum is one of the more common Mesoamerican species of *Sisyrinchium*. It can generally be recognized by its moderate height, more or less falcate leaves, winged and branched stems, and large, inflated, trigonous capsules 8–10 mm in diameter. The capsules are glabrous, in contrast to the related and sometimes similar *S. tenuifolium*, in which they are sparsely pubescent. The flowers are yellow and relatively large with tepals to 15 mm long, and the spathes of the inflorescence are distinctively broad, giving it a somewhat inflated appearance. The roots are fleshy and tuberous (Fig. 2A).

Typification of *Sisyrinchium convolutum* has posed some difficulty. The illustration in the protologue matches the species to which the name has been applied here and elsewhere, except for the swollen, almost bulbous base and the roots figured as forming a fibrous mass. A specimen in the herbarium at Bassano del Grappa, Vicenza, where Nocca's types are believed to be housed, matches closely the illustration but lacks a base and roots. Given the stylized depiction of these organs, it seems likely that the artist drew them from imagination. We have chosen the specimen rather than the illustration as lectotype.

Sisyrinchium convolutum was confused with *S. alatum*, a strictly South American species, by Baker (1892) amongst others. Baker used the name *S. alatum* var. *guatemalense* for the plant, as did Standley & Steyermark (1952) in the *Flora of Guatemala* and Molina (1975) in an enumeration of the plants of Honduras. *Sisyrinchium alatum* is probably not closely related to *S. convolutum* and does not have fleshy tuberous roots as do the latter and related species.

7. ***Sisyrinchium trinerve*** Baker, J. Bot. 14: 267. 1876. *Sisyrinchium bakeri* Klatt, Abh. Naturf. Ges. Halle 15: 378. 1882, nom. superfl. pro *S. trinerve*. TYPE: Bolivia. La Paz: vicinity of Sorata, *Mandon 1218* (lectotype, K, here designated); syntypes: *Mandon 1220* (K); *Pearce 87* (K). Figure 2B.

Known until recently only from the high Andes of Bolivia, Peru, Ecuador, Colombia, and Venezuela, *Sisyrinchium trinerve* has now been found in the páramo of Costa Rica above 3,000 m. It is readily recognized by its long, un-

branched, nearly terete stem; rigid, narrow, predominantly three-veined leaves; yellow perianth; and ovary at least partly included in the spathes. A lectotype has been designated, since the protologue includes three collections, none designated as a type (Baker, 1876), and no herbarium is mentioned, although the Kew Herbarium is assumed to house the specimens seen by Baker. The collection *Mandon 1218* was chosen, since it comprises the best-preserved and most complete material.

Additional specimens examined. COSTA RICA. LIMON: Cordillera de Talamanca, Kámuk massif, 3,000–3,300 m, *Davidse & Herrera Ch. 29375* (MO). CARTAGO–SAN JOSÉ: Cerro de la Muerte, páramo, along stream, *Heithaus 239* (MO).

8. ***Sisyrinchium longispathum*** Conzatti, Flora Taxonomica Mexicana 2, 2: 124. 1947. TYPE: Mexico. Oaxaca: *Conzatti 4203* (not seen).

Known from only a handful of collections, all from mountainous areas of the southern Mexican state of Oaxaca, *Sisyrinchium longispathum* has been recorded from a single site in Chiapas, *Breedlove 27156*, 22 km north of Tuxtla Gutierrez. The species appears to be restricted to limestone outcrops and cliffs. *Sisyrinchium longispathum* is distinctive among the Mesoamerican species of *Sisyrinchium* in having filiform leaves and 2–3 inflorescence units per flowering stem, all crowded at the apex and each subtended by a short leaf. The yellow flowers are typical of section *Echthronema*. *Sisyrinchium longispathum* has no close relatives among the Mesoamerican species of *Sisyrinchium*.

9. ***Sisyrinchium tenuifolium*** Humb. & Bonpl. ex Willd., Enum. Pl. Hort. Berol. 2: 691. 1809, Hort. Berol. 2: 691. 1809. TYPE: Mexico. Without precise locality, *Humboldt & Bonpland s.n.* (lectotype here designated, B—Herb. Willdenow—only microfiche seen).

Sisyrinchium tenuifolium is one of the smaller species of the genus and can usually be recognized by its branched stems, narrow basal leaves 0.5–2 mm wide, and swollen tuberous roots. The bright yellow flowers are more or less typical for section *Echthronema*. It is particularly variable, with plants ranging from slender and unbranched with very narrow leaves to robust with broad leaves and many-branched stems. The latter forms resemble *S. convolutum* fairly closely and

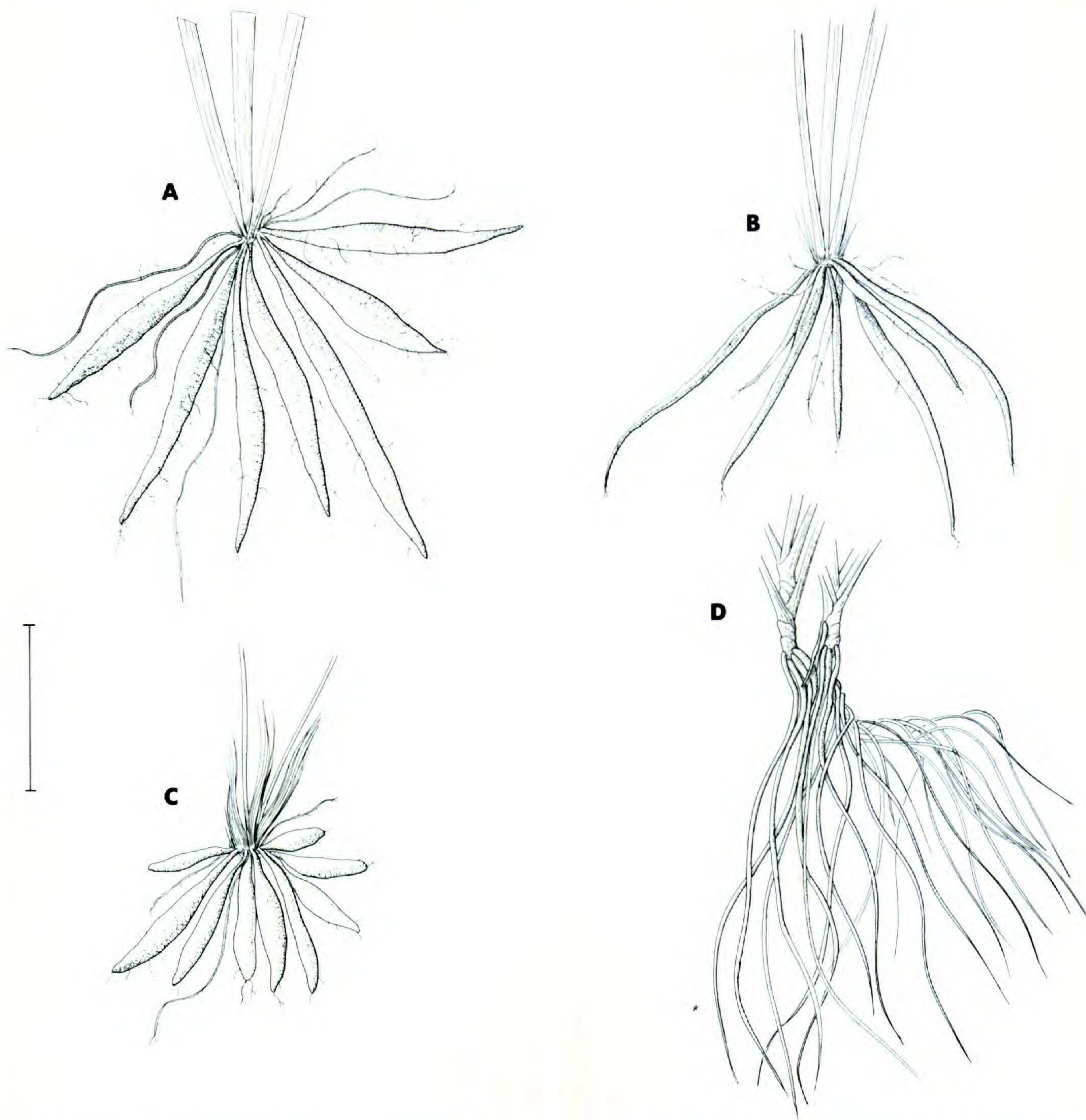


FIGURE 2. Root systems and stem bases.—A. *Sisyrinchium convolutum*.—B. *S. trinerve*.—C. *S. mandonii*.—D. *S. subcernuum*. Scale bar = 2 cm.

can be distinguished by their minutely pubescent ovary and smaller capsule.

The specimen in the Willdenow Herbarium at Berlin is chosen as the lectotype. Other Humboldt and Bonpland specimens of this species may be duplicates of the type collection and thus isoelectotypes, as is the illustration in the *Hortus Berolinensis*.

10. ***Sisyrinchium mandonii*** Baker, J. Bot. 14: 269. 1876. TYPE: Bolivia. La Paz: vicinity of Sorata, Rancho de Cochipata, *Mandon 1217* (lectotype, K, here designated; isoelectotypes, B, not seen, MO photo); syntypes: New Gran-

ada (Brazil), *Jurgensen 387* (K); New Granada, *Purdie s.n.* (K). Figure 2C.

Sisyrinchium mandonii has distinctive small, swollen, tuberous roots (Fig. 2C); branched stems; relatively narrow leaves 1–2 mm wide; and unusual large, ellipsoid capsules. It is predominantly Andean, represented by a few collections from Mesoamerica (*Steyermark 30513*, Guatemala; *Allen 698*, Costa Rica; *Woodson & Schery 427*, Panama), all from relatively high altitudes. It was first reported for Mesoamerica by Woodson (1945) from Panama.

Of the three collections cited by Baker in the protologue, *Mandon 1217* is selected as the lec-

tototype as it is in good condition and Baker annotated it as the "Type." There is no indication whether Baker saw any duplicates of this collection but this is certainly possible. The two other collections cited, both at Kew, appear to be the same species, although they are from New Granada in eastern Brazil where *Sisyrinchium mandonii* does not grow. Mislabeling seems likely here.

- 11. *Sisyrinchium tinctorium*** Kunth, Nov. Gen. Sp. 1: 324. 1815. TYPE: Venezuela. T.F. Amazonas: banks of the Orinoco near Esmeralda and the confluence of the Sodomónis, *Humboldt & Bonpland s.n.* (holotype, P).

Sisyrinchium bogotense Kunth, Nov. Gen. Sp. 1: 323. 1815. TYPE: Colombia. Cundinamarca: Bogotá, high plains between Suba and Suacha, *Humboldt & Bonpland s.n.* (holotype, P).

Sisyrinchium tinctorium is a common and well-known species in Mesoamerica. It also occurs in northern South America but is apparently less common there. It is distinguished by unbranched and often broadly winged flowering stems with terminal spathes, pale yellow flowers, and pendent, more or less pyriform capsules. Specimens in fruit are collected most often. The leaves have a characteristic thin, almost membranous texture when dry, and the roots are fibrous. Mesoamerican collections match the type of a second species, *S. bogotense*, particularly well. Our examination of the types of this and the Venezuelan *S. tinctorium* showed the two to be conspecific. The type specimens of *S. tinctorium* have comparatively narrowly winged stems and capsules smaller than most collections of the species. However, a few similar specimens have been collected in Mesoamerica, and variation is continuous from typical *S. tinctorium* to typical *S. bogotense*.

A diminutive species clearly allied to *Sisyrinchium tinctorium* is recognized here as *S. subalpinum*, which is shorter and has narrower leaves and smaller capsules than those of *S. tinctorium*.

- 12. *Sisyrinchium subalpinum*** Henrich & Goldblatt, sp. nov. TYPE: Costa Rica. Limón: Cordillera de Talamanca, Atlantic slope, Kámuk massif, páramo northeast of the main Kámuk peak, elev. 3,000–3,300 m, *Davidse & Herrera Ch. 29294* (holotype, MO). Figure 3.

Plantae 5–12 cm altae, radicibus aliquantum in-crassatis gracilibus sed non succulentis, foliis 1–2 mm latis $\frac{1}{3}$ ad longius quam caule, floribus flavis stellatis, tepalis 4–5 mm longis subaequalibus, filamentis 1.5 mm longis infra liberis, antheris ca. 2 mm longis, ramis styli ca. 1.5 mm longis, capsulis nutantibus glabris.

Plants 5–12 cm tall; the roots slender, somewhat thickened but cylindric, not fleshy or tuberous. Leaves several, all basal, $\frac{1}{3}$ to as long as the flowering stems, 1–2 mm wide. Flowering stems less than 1 mm wide, unbranched, comprising 1 internode, flattened but barely winged; spathes 11–16 mm, subequal or the outer to $\frac{1}{3}$ longer than the inner. Flowers small, yellow, stellate; tepals 4–5 mm long, subequal; filaments 1.5 mm long, free at least above (not seen below); anthers ca. 2 mm long. Ovary about 3 mm long; style branches ca. 1.5 mm long, slender, extending between the stamens. Capsules nodding, mature ones not seen, these probably somewhat pyriform and glabrous; seeds unknown.

Sisyrinchium subalpinum has been recorded at high elevations in Mexico (Chiapas) and in Guatemala and Costa Rica. It is restricted to páramos and moist, high, pine forests.

Additional specimens examined. MEXICO. CHIAPAS: Mt. Male near Porvenir, 3,200 m, *Matuda 4629* (MO). GUATEMALA. SAN MARCOS: along quebrada Canjula between Sibinal and Canjula, Volcán Tacana, 2,200–2,500, *Steyermark 35970* (F). COSTA RICA. CARTAGO: within 200 m of the summit of Cerro Chirripósillo, 3,400 m, *Weston 1574* (MO).

- 13. *Sisyrinchium subcernuum*** (Bickn.) Henrich & Goldblatt, comb. nov. *Hydastylis subcernuus* Bickn., Bull. Torrey Bot. Club 27: 385. 1900. TYPE: Mexico. Baja California Sur: Sierra de Laguna, *Brandeggee s.n.* (holotype, CAS). Figure 2D.

Sisyrinchium subcernuum belongs to what may be called the *S. tinctorium* complex, the species of which share similarly textured leaves, unbranched and winged flowering stems, and drooping capsules. The type is from Baja California Sur, and several more collections are known from higher elevations in Mexico. A few of the collections from Belize match the northern Mexico plants closely and must be treated as the same species. *Sisyrinchium subcernuum* can be recognized by its relatively narrowly winged stems, leaves 1–2 mm wide, small flowers with tepals about 6 mm long, and small capsules 6 mm long and 3 mm wide. The outer spathe of

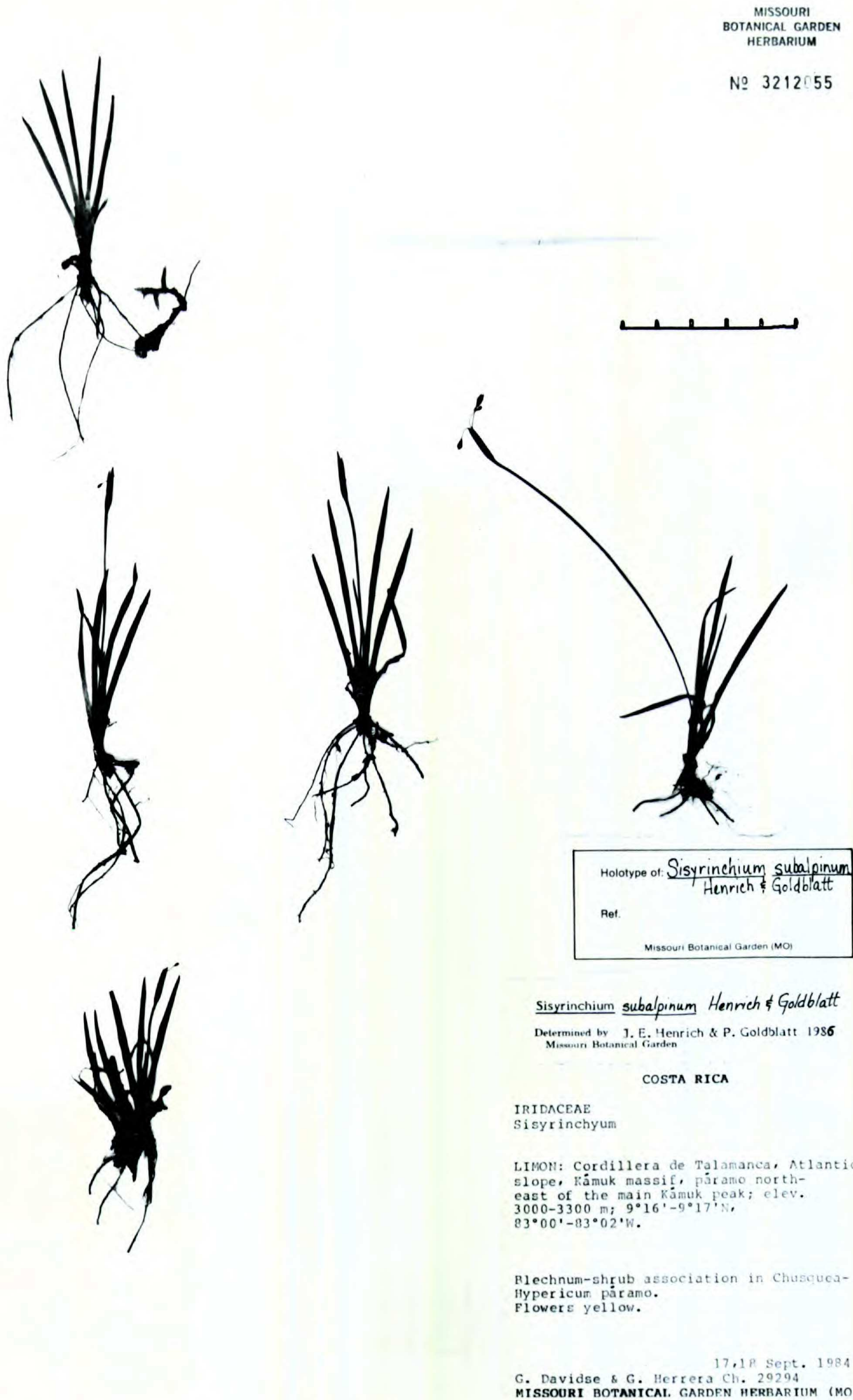


FIGURE 3. Type specimen of *Sisyrinchium subalpinum* (scale = 5 cm).

the inflorescence is longer than the inner, sometimes as much as twice as long.

Additional specimens examined. BELIZE. CAYO: near Millionario, 1,800 m, roadside, *Gentry 7694* (MO); between Millionario and Cuevas, *Dwyer 10821* (MO); vicinity of Cuevas, south of Millionario, ca. 1,900 m, *Croat 23602* (MO).

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